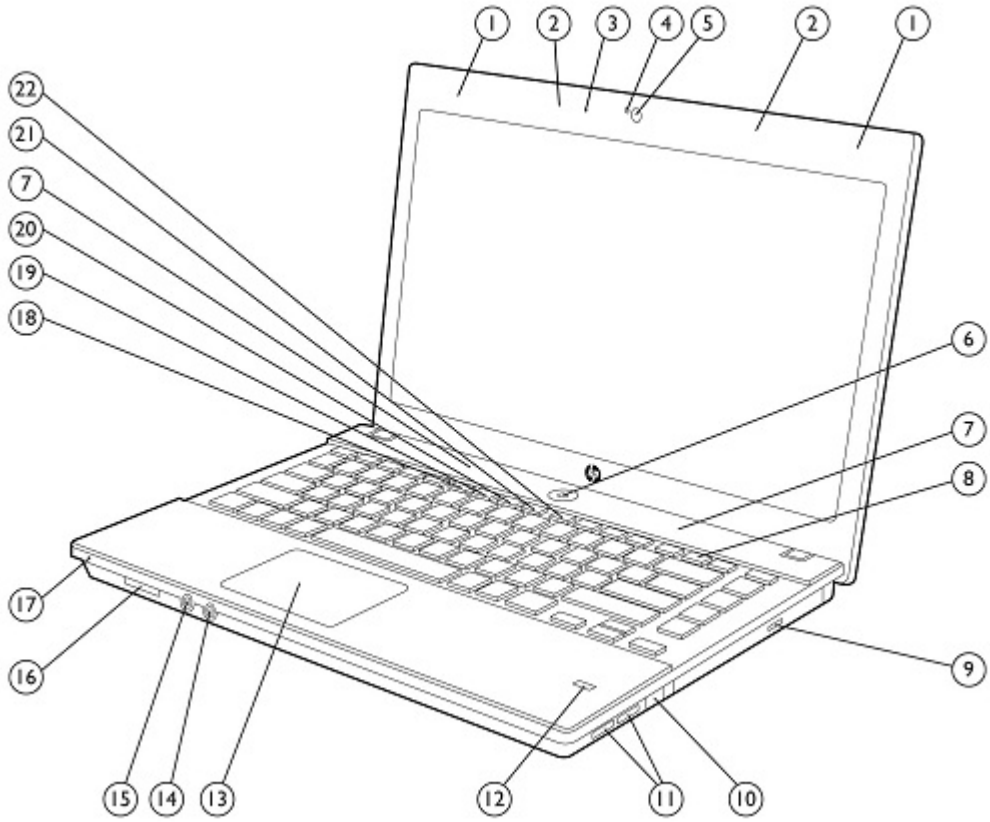
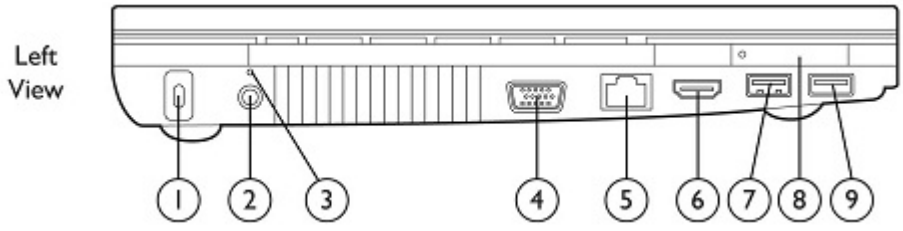
Overview



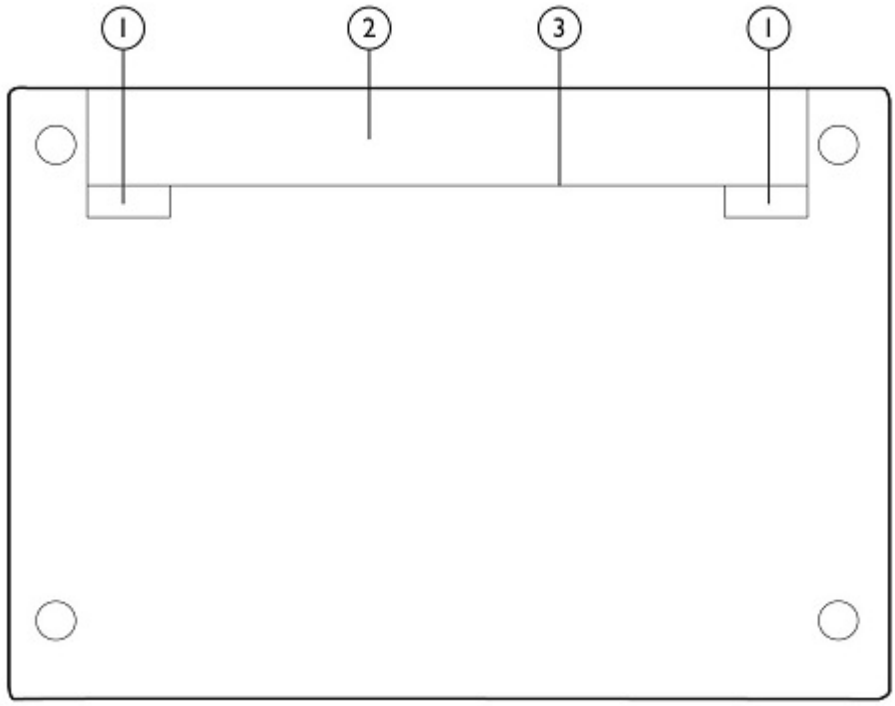
1. WWAN antennas
2. WLAN antennas
3. Integrated microphone
4. Webcam LED (works with optional webcam)
5. Optional 2 MP webcam
6. Power button with LED indicator
7. Stereo speakers
8. Wireless switch with LED indicator
9. Optical drive (select models)
10. Optional RJ-11/modem port
11. (2) USB 2.0 ports
12. Optional HP Fingerprint Sensor
13. ClickPad with left and right ClickPad buttons
14. Stereo microphone in
15. Stereo headphone/line out
16. Media Card Reader
17. Hard drive activity LED indicator
18. HP QuickLook 3 button with LED indicator
19. HP QuickWeb button with LED indicator
20. Volume mute button
21. Volume down button
22. Volume up button



1. Kensington Lock slot
2. Power connector
6. HDMI port
7. Combo eSATA/USB port

Overview

3. Battery charging LED indicator
4. VGA connector (external monitor/projector)
5. RJ-45/Ethernet port
8. ExpressCard/34 slot
9. USB 2.0 port



BottomView

1. Battery release latches
2. Battery bay
3. SIM card slot (select units, located inside battery bay)

At A Glance

- Genuine Windows 7 versions, SUSE Linux
- Thin, lightweight design with brushed aluminum finish for durability and style
- Colour choice of caviar or bordeaux finish on 4320s only
- Full-sized spill-resistant keyboard with better spaced keys
- ATI Mobility Radeon HD 5470 or HD 6370 discrete graphics, or integrated Intel HD Graphics
- ArcSoft TotalMedia Suite for playing, creating, and editing video and audio files
- New keyboard function keys for play, rewind, and fast-forward of video and audio files
- Corel Home Office productivity suite for word processing, spreadsheets, and presentations
- HDMI port for connecting to high-resolution displays; combo eSATA/USB port
- Face Recognition for HP ProtectTools for easy logins using the optional integrated 2 MP webcam
- Up to 500 GB 7200 rpm or 640 GB 5400 rpm hard drive with HP 3D DriveGuard protection
- HP Power Assistant to conserve power, increase battery run-time, monitor power needs, report workforce power consumption
- HP QuickLook 3 (quick access to e-mail, calendar, contacts and tasks), HP QuickWeb, and HP DayStarter
- HP Connection Manager 3.1
- Flexible wireless connectivity options:
    - Integrated HP un2420 EV-DO/HSDPA Mobile Broadband Module* provides worldwide Gobi mobile Internet technology with GPS

Overview

  - Integrated Intel Centrino® Advanced-N 6200 802.11 a/b/g/n, Atheros 802.11 b/g/n, wireless LAN module
  - 802.11 b/g/n with Bluetooth v3.0 High Speed (HS) combo card**
  - Bluetooth® v2.1
- Choice of 9-cell or 6-cell battery to customize weight and run-time to your needs
- Integrated Media Card Reader and ExpressCard/34 slot
- Widescreen LED-backlit HD display with 16:9 aspect ratio
  HP ProBook 4320s: 13.3-inch diagonal
  HP ProBook 4430s: 14.0-inch diagonal
- Choice of an Intel® Core™ i7, Core i5, Core i3, or Celeron processor
- Enhanced security features including HP ProtectTools, HP Face Recognition, Computrace LoJack Pro ready, HP SpareKey, HP Disk Sanitizer, optional HP Fingerprint Sensor, and optional HP Privacy Filter
- Optional optical drives include Blu-ray ROM DVD+/-RW SuperMulti DL Drive for high-definition playback and DVD+/-RW SuperMulti DL LightScribe Drive for burning custom labels directly to your discs

* Available only on HP ProBook 4320s with Intel HD Graphics.
**Available on select models.

Standard Features (availability may vary by country)

Processors

Intel Core i5-520M Processor (2.4 GHz, 3 MB L3 cache)*
Up to 2.93 GHz with Intel Turbo Boost Technology

Intel Core i5-480M Processor (2.66 GHz, 3 MB L3 cache)*
Up to 3.18 GHz with Intel Turbo Boost Technology

Intel Core i3-390M Processor(2.66GHz, 3M L3 Cache)*

Intel Core i3-370M Processor (2.4 GHz, 3 MB L3 cache)*

NOTE: Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.

* Intel's numbering is not a measurement of higher performance.

Operating System

Preinstalled

Genuine Windows 7 Professional Edition 32*
Genuine Windows 7 Professional Edition 64*
Genuine Windows 7 Home Premium Edition 32*
Genuine Windows 7 Home Premium Edition 64*
Genuine Windows 7 Home Basic Edition 32*
Genuine Windows 7 Starter 32*††
SUSE Linux Enterprise Desktop 11

Certified

SUSE Linux Enterprise Desktop 11

* System may require upgraded and/or separately purchased hardware and/or a DVD drive to install the Windows 7 software and take full advantage of Windows 7 functionality.
See: http://www.microsoft.com/windows/windows-7/ for details.

** Certain Windows Vista product features require advanced or additional hardware. See: http://www.microsoft.com/windowsvista/getready/hardwarereqs.mspx and http://www.microsoft.com/windowsvista/getready/capable.mspx for details. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit: http://www.windowsvista.com/upgradeadvisor.

†† Windows 7 Starter available only on select hardware configurations.

Chipset

Mobile Intel HM57 Express Chipset

Graphics

Integrated graphics:
Intel HD Graphics
Microsoft DirectX 10.1 capable

Discrete graphics:
ATI Mobility Radeon HD 5470 graphics controller with 512 MB dedicated video memory
Microsoft DirectX 11 capable
ATI Mobility Radeon HD 6370 graphics controller with 1GB dedicated video memory
Microsoft DirectX 11 capable

Standard Features (availability may vary by country)

Display	Internal	HP ProBook 4320s: 13.3-inch diagonal LED-backlit HD anti-glare (1366 x 768 resolution) HP ProBook 4420s: 14.0-inch diagonal LED-backlit HD anti-glare (1366 x 768 resolution) Optional HP Privacy Filter
	External	Up to 32-bit per pixel colour depth VGA port supports resolutions up to 2048 x 1536 at 75 Hz, and lower resolutions at up to 100 Hz. HDMI port supports direct connection to high-definition displays with up to 1920 x 1080 resolution and 7-channel audio with one convenient cable (not included). NOTE: Resolutions are dependent upon monitor capability, and resolution and colour depth settings.

Memory	Standard	DDR3 PC3-8500 (1066 MHz)* or PC3-10600 (1333 MHz)* SDRAM Two SODIMM slots supporting dual-channel memory 1024 MB, 2048 MB, and 4096 SODIMMs
	Maximum	Upgradeable to 8192 MB with 4096 MB SODIMMs in slots 1 and 2
	Dual-channel	Maximized dual-channel performance requires SODIMMs of the same size and speed in both memory slots.

* Memory speed is processor dependent.

NOTE: Due to the non-industry standard nature of some third-party memory modules, we recommend HP branded memory to ensure compatibility. If you mix memory speeds, the system will perform at the lower memory speed. Full availability of 4 GB or more of memory requires Windows Vista Business 64-bit or Linux. With Windows 32-bit operating systems, the amount of usable memory is dependent upon your configuration, so that above 3 GB all memory may not be available due to system resource requirements.

Communications	Realtek Ethernet (10/100/1000 NIC)* Optional 56K V.92 modem**

* The term "10/100/1000" or "Gigabit" Ethernet indicates compliance with IEEE standard 802.3ab for Gigabit Ethernet, and does not connote actual operating speed of 1 Gb/s. For high-speed transmission, connection to a Gigabit Ethernet server and network infrastructure is required.

** Designed for downloads from 56K modem compliant sources. Maximum achievable download transmission rates currently do not reach 56 KB/s, and will vary with line conditions. Modem availability is subject to country regulatory approval.

Standard Features (availability may vary by country)

Wireless Devices	Support for a broad range of secure, integrated wireless LAN and wireless WAN options featuring support for the latest industry standards. Mobile Broadband (WWAN) requires a Windows operating system and is available in select countries as a factory configurable feature for the HP ProBook 4320s only. Integrated Bluetooth is also available (factory configurable only) and can be combined with any of the supported wireless LAN and wireless WAN options.
HP un2420 EV-DO/HSPA Mobile Broadband Module (available for HP ProBook 4320s with Intel HD Graphics only)	Integrated mobile broadband module with Gobi global mobile Internet technology that provides connectivity to both CDMA (EVDO) and UMTS (HSPA) networks. It also provides GPS functionality for various mapping applications and security applications. NOTE: Separately purchased mobile network operator service is required. Two 850/900/1575/1800/1900/2100 MHz antennas integrated in the top of the display panel support current and future WWAN technologies.
All 802.11 integrated wireless LAN options	Wi-Fi certified* Wired Equivalent Privacy (WEP) support up to 128-bit keys Wi-Fi Protected Access (WPA) and WPA2 support 802.1x authentication support, including EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP-MSCHAPv2, and LEAP Advanced Encryption Standard (AES) support Dual antennas integrated in the display enclosure
Intel Centrino Advanced-N 6200 (2x2)	Integrated support for 802.11a, b, g, and n* 2 transmit, 2 receive antennas Up to 300 mbps data rate
Atheros 9285G 802.11b/g/n (1x1)	Integrated support for 802.11b, g, and n Up to 300 mbps data rate
Ralink RT3090BC4 802.11b/g/n WiFi and Bluetooth 3.0 HS Combo Adapter	Integrated support for 802.11 b, g, and n Up to 150 mbps data rate Bluetooth Specification 3.0 High Speed (HS) compliant Works with a wide range of Bluetooth devices
HP Integrated Module with Bluetooth 2.1+EDR Wireless Technology	Bluetooth Specification v2.1+EDR compliant Works with a wide range of Bluetooth devices

* In countries where 802.11n is not allowed, this capability is not enabled (Intel 802.11a/b/g only).

Keyboard	The HP spill-resistant keyboard is designed using a thin layer of Mylar film under the keyboard. The 101/102-key compatible keyboard features a full-pitch key layout with desktop keyboard features, such as the isolated inverted-T cursor control keys, editing keys, both left and right control and alt keys, and 12 function keys. US and International key layouts are available. Other features include hotkeys for instant access to power conservation and brightness, and 19.05 x 19.05 mm key pitch (centre-to-centre spacing).
Pointing device	ClickPad with gestures support: Two-finger scroll, zoom, pinch and pivot rotate

Standard Features (availability may vary by country)

Expansion card slots	ExpressCard/34 slot	Supports ExpressCard/34 (34 mm x 75 mm x 5 mm) card sizes
	Media Card Reader	Supports SD (Secure Digital), MMC (MultiMedia Card), Memory Stick, Memory Stick Pro, Memory Stick Duo*, xD-Picture card
	* Memory Stick Duo Adapters are required and sold separately. Inserting a Memory Stick Duo Card directly into your notebook could damage the memory card and/or notebook.	
Storage	Internal Storage Device	250/320/500 GB 7200 rpm SMART SATA II Hard Drive 640 GB 5400 rpm SMART SATA II Hard Drive
	NOTE: Up to 15 GB is reserved for the system recovery software.	
	HP 3D DriveGuard (Windows models only)	The hard drive is mounted directly to the notebook frame, reducing the transmission of shock to the hard drive. Uses three-axis digital motion detection with intelligent sensitivity to help protect the hard drive during normal use from shock and vibration. The digital accelerometer temporarily halts all data transfer and parks the hard drive when abrupt motion is detected.
	Fixed optical drives	Blu-ray ROM DVD+/-RW SuperMulti DL LightScribe Drive* DVD+/-RW SuperMulti DL LightScribe Drive
	* Support for the Blu-ray DVD drive on configurations with integrated graphics requires Windows7 or Windows Vista; configurations with discrete graphics support it with any offered Windows operating system.	
Interfaces	VGA	One
	HDMI	One
	Stereo microphone in	One
	Stereo headphone/line out	One
	Power connector	One
	RJ-11/modem (optional)	One
	RJ-45/Ethernet	One
	Combo eSATA/USB 2.0	One
	USB 2.0	Three
	LED status indicators	Eight

Standard Features (availability may vary by country)

Audio/Visual

HD audio (HP Premier Sound)
Integrated stereo speakers
Integrated digital microphone
Stereo headphone/line out
Stereo microphone in

Optional 2 MP webcam

- Supports videoconferencing and still image capture
- Improved quality for video streaming and still image capture (1600x1200 resolution)
- Up to 30 frames/sec
- Fixed focus lens
- 16-bit true colour (camera sensor up to UXGA resolution)

Software

Preinstalled software with Windows Operating System

HP Recovery Manager (available with Windows 7 only)
HP Support Assistant (available with Windows 7 only)
HP ProtectTools Security Manager
HP Face Recognition
HP QuickLaunch Buttons Software
HP QuickLook 3
HP QuickWeb
HP Power Assistant
HP Connection Manager 3.1
HP Wireless Assistant
HP DayStarter
Corel Home Office productivity suite 60-day trial
Roxio Creator Business (select models)
ArcSoft Total Media Suite
Antivirus software (may vary by country)*
Microsoft Office 2010 preloaded (purchase of a Product Key required to activate a full Office 2010 suite)*
Norton Online Backup trial
HP Webcam Software (select models)
Skype
WinZip 12 trial

Additional software available from the web

HP SoftPaq Download Manager

* Internet access required. May be Norton or McAfee antivirus software. First 60 days included. Subscription required for live updates afterwards.
** Microsoft Office 2010 Preloaded includes reduced functionality versions of Word and Excel. Purchase of Product Key required to activate full Office 2010 suite available at participating resellers/retailers and http://www.office.com.

HP Recovery Manager

Models shipped with Windows 7 include HP Recovery Manager. HP Recovery Manager enables fast recovery of the factory preinstalled image if the system becomes corrupted or if important system files are accidentally deleted. Up to 15 GB of the hard drive is reserved for the system recovery software.

Standard Features (availability may vary by country)

Security	Standard Features	HP ProtectTools Security Manager Face Recognition for HP ProtectTools One Step Login Enhanced Pre-Boot Security HP SpareKey HP Disk Sanitizer Setup Password Kensington Lock Slot Support for Computrace* LoJack Pro for HP ProtectTools
	Optional Features	HP Fingerprint Sensor HP Privacy Filter

* The Computrace agent is shipped turned off, and must be activated by customers when they purchase a subscription with terms ranging from one to five years.
For more information on HP security solutions refer to: http://www.hp.com/go/security.

HP ProtectTools Security Manager

HP ProtectTools Security Manager is the security platform for business notebooks and desktops. The HP ProtectTools Security Manager is an extensible client security console that delivers enhanced security capabilities through add-on software modules. The following modules are available on the hard drive (also downloadable from the web) and can be configured in Software Setup:

- Credential Manager for HP ProtectTools
- Device Access Manager for HP ProtectTools
- Drive Encryption for HP ProtectTools
- File Sanitizer for HP ProtectTools
- Privacy Manager for HP ProtectTools (Chat & Sign)
- Embedded Security for HP ProtectTools
- Computrace LoJack Pro for HP ProtectTools

HP ProtectTools is now centrally manageable with the capability to manage notebooks from a single point. Security is management ready out of the box, in partnership with Digital Persona. New features address requirements that customers expect from a centrally managed security solution such as user provisioning, credential reset, and credential revocation.

HP ProtectTools provides two separate management solutions, targeted at the enterprise and the SMB:

- Digital Persona Pro AD: Designed for the enterprise customer. Integrates with Active Directory and gives IT Managers the ability to provision users, create login policies based on passwords, biometrics or smartcards. Management features also include remote credential recovery in case the user forgets the password, loses the smartcard or cannot use the fingerprint reader for any reason. In addition, advanced auditing capabilities are also built in. Digital Persona Pro AD is available now.
- Digital Persona Pro Workgroup: Designed for the small business customer. Provides features similar to the Active Directory version, but for workgroups. Workgroup activation is built into HP ProtectTools, and activation of up to 5 seats is completely free.

Standard Features (availability may vary by country)

Power Supply

Models with integrated graphics: External 65-watt Smart AC adapter
External 90-watt Smart AC adapter
6-foot (1.8-metre) power cord included; total length including external AC adapter is 12 feet (3.66 metre)
HP Fast Charge*

* HP Fast Charge recharges your battery up to 90% within 90 minutes when the system is off. HP Fast Charge does not apply to the HP 9-cell battery.

Battery

Primary battery	HP 9-cell (93 WHr) Li-Ion battery HP 6-cell (47 WHr) Li-Ion battery

Battery Life

	Configurations with integrated Intel HD Graphics	Configurations with discrete ATI Mobility Radeon HD 5470 graphics	Configurations with ATI Mobility Radeon HD 6370
HP ProBook 4320s			
9-cell battery	Up to 10 hours	Up to 8 hours and 45 minutes	Up to 8 hours
6-cell battery	Up to 5 hours	Up to 4 hours and 30 minutes	Up to 4 hours and 30 minutes
HP ProBook 4420s			
9-cell battery	Up to 10 hours	Up to 8 hours and 15 minutes	Up to 8 hours and 45 minutes
6-cell battery	Up to 4 hours and 30 minutes	Up to 3 hours and 45 minutes	Up to 4 hours and 30 minutes

NOTE: Battery life will vary depending on the product model, configuration, loaded applications, features, use, wireless functionality and power management settings. The maximum capacity of the battery will naturally decrease with time and usage. See MobileMark07 battery benchmark www.bapco.com/products/mobilemark2007 for additional details.

System Standby Time

Up to 1 week

Power Conservation

Supports enhanced Intel SpeedStep technology (allows Battery Optimized Mode, Maximum Performance Mode, or Automatic mode)
ATI PowerPlay technology
Hibernation
Standby
ACPI compliance

Standard Features (availability may vary by country)

Service and Support	HP Services offers limited 1-year warranty. 1-year limited warranty on primary battery. Warranty upgrades are also available. HP Care Pack Services extend service contracts beyond the standard warranties. To choose the right level of service for your HP product, use the HP Care Pack Services Lookup Tool at: http://www.hp.com/go/lookuptool. Additional HP Care Pack Services information by product is available at: http://www.hp.com/hps/carepack. NOTE: Certain restrictions and exclusions apply. Consult the HP Customer Support Centre for details. http://h20000.www2.hp.com/bizsupport/TechSupport/ProductRoot.jsp.

Options (availability may vary by country)

Memory	HP 1 GB (DDR3 1333 MHz) SODIMM	AT911AA
	HP 2 GB (DDR3 1333 MHz) SODIMM	AT912AA
	HP 4 GB (DDR3 1333 MHz) SODIMM	AT913AA
Storage	HP 250 GB USB Pocket Media Hard Drive	FE477AA
	HP External USB CD/DVD R/RW Drive	FS943AA
Communication	HP WLAN 802/11 a/b/g/draft-n Mini-card Kit	KM591AA#xxx
Expansion	HP Basic Adjustable Stand	AL549AA
	HP USB 2.0 Docking Station	FQ834AA
	HP Essential USB 2.0 Port Replicator	AQ731AA
	HP Dual Hinge Notebook Stand	AW661AA
	HP Display & Notebook Stand	AW662AA
	HP Adjustable Display Stand	AW663AA
	HP Adjustable Dual Display Stand	AW664AA
Power	65W Smart AC Adapter	ED494AA
	90W Smart AC/Auto/Air Combo Adapter	AJ652AA
	HP 65W Slim Adapter	AX727AA
	HP Smart 65W Travel AC Adapter	AU155AA
	90W Smart AC Adapter	ED495AA
	HP 6-Cell Li-Ion Primary Battery	BQ350AA
Carrying Cases	HP Deluxe Nylon Backpack	RR317AA
	HP Value Nylon Case	RR314AA
	HP Universal Nylon Case	RR315AA
	HP Executive Leather Case	RR316AA
	HP Deluxe Roller Case	GD405AA
	HP Basic Backpack	AM863AA
	HP Basic Messenger	AP355AA
	HP Basic Carrying Case	AJ078AA
	HP Professional Series Carrying Case	AT886AA
	HP Professional Series Backpack	AT887AA
	HP Professional Series Messenger	AT888AA
	HP Professional Series Designer Tote	AT889AA
	HP Professional Series Slip Case	AT890AA
	HP Elite Series Quick Case	AT892AA

Options (availability may vary by country)

Security	HP/Kensington MicroSaver Security Lock	PC766A
	HP Notebook Cable Lock	AY475AA
	HP Privacy Filter For 13.3 in	AU649AA
	HP Privacy Filter For 14.0 in	AU100AA
Input/Output Devices	HP USB/PS2 Optical 2-Button Scroll Mouse	DC369A
	HP USB Keyboard & Mouse Bundle	RC465AA
	HP USB Optical Travel Mouse	RH304AA
	HP Wireless Mouse	AR085AA
	HP BT Headset	AR084AA
	HP Mobile Audio Speakers	FS944AA
	HP Mobile Productivity Bundle	AQ729AA
	HP Notebook Companion Projector	AX325AA
	HP Special Edition Optical Mouse	AU094AA
	HP Premium Autofocus Webcam	KQ245AA
	Premium Digital Headset	KJ270AA
	HP Promo USB Graphics Adapter	NL571AT

Memory

DDR3 PC3--8500 (1066 MHz)* or DDR3 PC3-10600 (1333 MHz)* SDRAM
Two SODIMM slots supporting dual-channel memory
SODIMM sizes supported: 1024 MB, 2048 MB and 4096 MB

Standard Memory

- 1024 MB (1024 MB x 1)
- 2048 MB (2048 MB x 1)
- 2048 MB (1024 MB x 2)
- 3072 MB (2048 MB + 1024 MB)
- 4096 MB (2048 MB x 2)
- 4096 MB (4096 MB x 1)

Optional Memory Upgrades

Support for up to 8192 MB of memory with the installation of optional DDR3 SDRAM memory kits. Both memory slots are user accessible. Please refer to the Hardware and Software Guide for installation procedures. Maximized dual-channel performance requires SODIMMs of the same size and speed in both memory slots.

Up to	Slot 1	Slot 2
2048 MB	1024 MB	1024 MB
2048 MB	2048 MB	empty
3072 MB	2048 MB	1024 MB
4096 MB	2048 MB	2048 MB
4096 MB	4096 MB	empty
8192 MB	4096 MB	4096 MB

* Memory speed is processor dependent.

NOTE: This chart does not represent all possible memory configurations. Due to the non-industry standard nature of some third-party memory modules, we strongly recommend using only HP branded memory modules to ensure compatibility. If you mix memory speeds, the system will perform at the lower memory speed. Availability of 4 GB or more of memory requires Windows Vista Business 64-bit or Linux. With Windows 32-bit operating systems, memory above 3 GB may not all be available due to system resource requirements.

Memory Upgrades

HP 1 GB (DDR3 1333 MHz) SODIMM	AT911AA
HP 2 GB (DDR3 1333 MHz) SODIMM	AT912AA
HP 4 GB (DDR3 1333 MHz) SODIMM	AT913AA

Removable Media Drive Support

	Quantity Supported	Drive Bay
Blu-ray ROM DVD+/-RW SuperMulti DL LightScribe Drive*	One	Fixed optical drive bay
DVD+/-RW SuperMulti DL LightScribe Drive	One	Fixed optical drive bay

* Support for the Blu-ray DVD drive on configurations with integrated graphics requires Windows7 or Windows Vista; configurations with discrete graphics support it with any offered Windows operating system.

Internal Storage Device

	Quantity Supported	Drive Bay
Hard Drives		
500 GB 7200 rpm SMART SATA II Hard Drive	One	Dedicated hard drive bay
320 GB 7200 rpm SMART SATA II Hard Drive	One	Dedicated hard drive bay
250 GB 7200 rpm SMART SATA II Hard Drive	One	Dedicated hard drive bay
750 GB 5400 rpm SMART SATA II Hard Drive	One	Dedicated hard drive bay
640 GB 5400 rpm SMART SATA II Hard Drive	One	Dedicated hard drive bay

System Unit	Dimensions (HxWxD)	HP ProBook 4320s: 1.07 in (at front) x 12.75 in x 8.98 in 27.0 mm (at front) x 324 mm x 228.0 mm HP ProBook 4420s: 1.07 in (at front) x 13.23 in x 9.15 in 27.0 mm (at front) x 336 mm x 232.4 mm	
	Weight	HP ProBook 4320s: Starting at 4.45 lb (2.02 kg) without optical drive or 4.74 lb (2.15 kg) with optical drive HP ProBook 4420s: Starting at 4.71 lb (2.14 kg) without optical drive or 5.0 lb (2.27 kg) with optical drive	
	NOTE: Height varies depending upon where on the notebook the measurement is made. Weight varies by configuration and components. Weight includes 6-cell battery, no optical drive. Weight varies by configuration and components.		
	Stand-Alone Power Requirements (AC Power)	Nominal Operating Voltage	18.5 V
		Average Operating Power	with integrated graphics: 18 W with discrete graphics: 21 W
		Max Operating Power	< 90 W or < 65W
	Temperature	Operating	32° to 95° F (0° to 35° C) (not writing optical) 41° to 95° F (5° to 35° C) (writing optical)
		Non-operating	-4° to 140° F (-20° to 60° C)
	Relative Humidity	Operating	10% to 90%, non-condensing
		Non-operating	5% to 95%, 101.6° F (38.7° C) maximum wet bulb temperature
	Shock	Operating	125 G, 2 ms, half-sine
		Non-operating	200 G, 2 ms, half-sine
	Random Vibration	Operating	0.75 grms
		Non-operating	1.50 grms
	Altitude (unpressurized)	Operating	-50 to 10,000 ft (-15.24 to 3,048 m)
		Non-operating	-50 to 40,000 ft (-15.24 to 12,192 m)
	Industry Standard Certifications	UL	Yes
		CSA	Yes
		FCC Compliance	Yes
		ENERGY STAR®	Select models*
		EPEAT	Registered TBD in United States**
		ICES	Yes
		Australia / NZ A-Tick Compliance	Yes
		CCC	Yes
		Japan VCCI Compliance	Yes

MIC	Yes
BSMI	Yes
CE Marking Compliance	Yes
BNCI or BELUS	Yes
CIT	Yes
GOST	Yes
Saudi Arabian Compliance (ICCP)	Yes
SABS	Yes
UKRSERTCOMPUTER	Yes

* Configurations of the HP ProBook 4320s and HP Probook 4420s that are ENERGY STAR qualified are identified as HP ProBook 4320s ENERGY STAR and HP Probook 4420s ENERGY STAR on HP websites and on www.energystar.gov.

** EPEAT registration varies by country. See www.epeat.net for registration status by country. EPEAT status listed above applies to U.S.

NOTE: For accessibility information on HP products, please visit: http://www.hp.com/accessibility.

HP 65W Smart AC Adapter	Dimensions	4.17 x 1.85 x 1.1 in (10.6 x 4.7 x 2.8 cm)	
	Weight	0.62 lb (280 g)	
	Input	100 to 240 VAC	
		Input Efficiency	87% min at 115 VAC
		Input frequency range	47 to 63 Hz
		Input AC current	1.7 A at 90 VAC, 0.85 A at 180 VAC
	Output	Output power	65W
		DC output	18.5V
		Hold-up time	5 msec at 115 VAC input
		Output current limit	<11A, Over voltage protection- 29V max automatic shutdown
	Connector	3 pin/grounded, mates with interchangeable cords	
	Environmental Design	Operating temperature	32° to 104° F (0° to 40° C)
		Non-operating (storage) temperature	-4° to 149° F (-20° to 65° C)
		Altitude	0 to 10,000 ft (0 to 3,048 m)
		Humidity	20% to 80%
		Storage Humidity	10% to 90%
	EMI and Safety Certifications	CE Mark - full compliance with LVD and EMC directives; Worldwide safety standards - IEC60950, EN60950, UL60950, Class1, SELV; Agency approvals - C-UL-US, NORDICS, DENAN, EN55022 Class B, FCC Class B, CISPR22 Class B, CCC, NOM-1 NYCE; MTBF - over 200,000 hours at 25°C ambient condition.	

Technical Specifications

NOTE: Unless otherwise noted, temperature limits listed in the following component specifications relate to the internal temperatures of these components and not to the environment in which the PC is operating.

Displays

14.0-inch LED HD (1366 x 768) anti-glare	Active Area (W x H)	12.74 x 7.56 in (32.4 x 19.2 cm)	
	Diagonal Size	14.0 in (35.6cm)	
	Surface Treatment	Anti-glare	
	Contrast Ratio	400:1 (typical)	
	Refresh Rate	60 Hz	
	Brightness	200 nit (typical)	
	Pixel Resolution	Pitch	0.227 mm
		Format	1366 x 768
		Configuration	RGB Stripe
	Backlight	LED	
	PPI	112 ppi	
	Viewing Angle	±30° Horizontal, ±10° Vertical (minimum) 30/30/20/10 (Left/Right/Down/Up) (minimum) or 45/45/35/25 (Left/Right/Down/Up) (typical)	

13.3-inch LED HD (1366 x 768) anti-glare	Active Area (W x H)	11.53 x 6.49 in (29.3 x 16.5 cm)	
	Diagonal Size	13.3 in (33.8cm)	
	Surface Treatment	Anti-glare	
	Contrast Ratio	400:1 (typical)	
	Refresh Rate	60 Hz	
	Brightness	200 nit (typical)	
	Pixel Resolution	Pitch	0.215 mm
		Format	1366 x 768
		Configuration	RGB Stripe
	Backlight	LED	
	PPI	118 ppi	
	Viewing Angle	±30° Horizontal, ±10° Vertical (minimum) 30/30/20/10 (Left/Right/Down/Up) (minimum) or 45/45/35/25 (Left/Right/Down/Up) (typical)	

Internal Storage

Technical Specifications

500 GB 7200 rpm SATA Hard Drive	Drive Weight	0.25 lbs (115g)	
	Capacity	500 GB	
	Height	0.37 in (9.5 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ	
	Transfer Rate	Synchronous (maximum)	150 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	Single Track	1.5ms
		Average	11ms
		Maximum	22ms
	Rotational Speed	7200 rpm	
	Logical Blocks	976,773,168	
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]	
	Features	ATA Security	

320 GB 7200 rpm SATA Hard Drive	Drive Weight	0.25 lbs (115g)	
	Capacity	250 GB	
	Height	0.37 in (9.5 mm) or on some models 0.28 in (7 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ	
	Transfer Rate	Synchronous (maximum)	150 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	Single Track	1.5ms
		Average	11ms
		Maximum	22ms
	Rotational Speed	7200 rpm	
	Logical Blocks	625,142,448	
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]	
	Features	ATA Security	

Technical Specifications

250 GB 7200 rpm SATA Hard Drive	Drive Weight	0.25 lbs (115g)	
	Capacity	250 GB	
	Height	0.37 in (9.5 mm) or on some models 0.28 in (7 mm)	
	Width	2.75 in (70 mm)	
	Interface	ATA-8, SATA 2.6, 3.0 Gb/s, NCQ	
	Transfer Rate	Synchronous (maximum)	150 MB/s (Drive Capability)
	Seek Time (typical reads, including settling)	Single Track	1.5ms
		Average	11ms
		Maximum	22ms
	Rotational Speed	7200 rpm	
	Logical Blocks	488,397,168	
	Operating Temperature	32° to 140° F (0° to 60° C) [case temp]	
	Features	ATA Security	

Optical Drives

DVD+/-RW SuperMulti DL LightScribe Drive	Access Times	Random	< 150ms CD (typical)
			< 160 ms DVD (typical)
	Max Data Transfer Rate	24X CD-ROM	Up to 3,600 KB/s
		8X DVD	Up to 10,800 KB/s
		24X CD-R	Up to 3,600 KB/s
		16X CD-RW	Up to 2,400 KB/s
		8X DVD+R	Up to 10,800 KB/s
		8X DVD+RW	Up to 10,800 KB/s
		8X DVD-R	Up to 10,800 KB/s
		6X DVD-RW	Up to 8100KB/s
		4X - DVD+R Dual Layer	Up to 5,400 KB/s
		4X - DVD-R Dual Layer	Up to 5,400 KB/s
		5X DVD-RAM	Up to 6,750 KB/s
	Transfer Mode	UDMA Mode 5	
	Interface	Gen 1 SATA	
	Supported Media (read)	CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM	
	Supported Media (write)	CD-R, CD-RW, DVD+R, DVD+RW, DVD-R, DVD-RW, DVD-RAM, LightScribe	
	Max Media Capacity (read)	8.5 GB	
	Max Media Capacity (write)	8.5 GB	

	Transport	Tray Loading	
Blu-ray ROM DVD+/-RW SuperMulti DL LightScribe Drive	**Access Times**	Random	<190 ms CD-ROM (typical) < 190ms DVD-ROM (typical) <230 ms BD-ROM (typical)
	Max Data Transfer Rate	24X CD-ROM	Up to 3600KB/s
		8X DVD-ROM	Up to 10800 KB/s
		16X CD-R	Up to 1,200KB/s
		10X CD-RW	Up to 1500 KB/s
		8X DVD+R	Up to 10800 KB/s
		8X DVD+RW	Up to 10,800KB/s
		8X DVD-R	Up to 10800 KB/s
		6X DVD-RW	Up to 8,100 KB/s
		4X - DVD+R Dual Layer	
		4X - DVD-R Dual Layer	Up to 5400 KB/s
		5X DVD-RAM	Up to 6750 KB/s
		4X BD-ROM	Up to 18,000KB/s
	Transfer Mode	UDMA Mode 5	
	Interface	Gen 1 SATA	
	Supported Media (read)	CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW. DVD-RAM, BD-ROM, BD-R, BD-RE	
	Supported Media (write)	CD-R, CD-RW, DVD+R, DVD+R(9), DVD+RW, DVD-R, DVD-R(9), DVD-RW, DVD-RAM, LightScribe	
	Max Media Capacity (read)	50.0 GB	
	Max Media Capacity (write)	8.5GB	
	Transport	Tray Loading	
Security			

Technical Specifications

HP Fingerprint Sensor (optional)	Mobile Voltage Operation	3.0V-3.6V Single Supply
	Operating Temperature	32° - 158°F (0° - 70°C)
	Current Consumption @ 3.3V	Less than 70 mA peak imaging and scrolling Less than 25 mA hardware finger detection Advanced Power Management
	High-Rate Image Capture	Up to 240 image frames /sec
	ESD Resistance	IEC 61000-4-2 Level 4 (±15KV)
	Detection Matrix	192 x 16 Pixels 9.7 mm x 0.81 mm 500 ppi High-Resolution Images

Audio

Hardware	Implementation	IDT 92HD80 High Definition CODEC
	Keyboard hotkeys	Volume up, volume down, and mute Play, rewind, and fast-forward
	Full Duplex	Yes
	Microphone In	Stereo
	Headphone/Line Out	Stereo
	Integrated Microphone	Yes

Audio Output Quality	Frequency Response	20 Hz - 20 kHz
	Signal to Noise Ratio	>85 dB
	Total Harmonic Distortion	0.01%
	Noise Floor	-110 dB
	Play/Record Sampling Rate(s)	8 kHz - 48kHz
	DAC	16, 20 or 24-bit
	ADC	16 or 20-bit

Integrated Stereo Speakers	Power Rating	1.5 Watts
	Impedance	4 Ohms

Communications

Integrated Realtek RTL8151DH-GR 10/100/1000 NIC	Ethernet Features	10 Mbit/s operation (10BASE-T; IEEE 802.3i; IEEE 802.3 clauses 13-14) 100 Mbit/s operation (100BASE-TX; IEEE 802.3u; IEEE 802.3 clauses 21-30) 1000 Mbit/s operation (1000BASE-T; IEEE 802.3z and 802.3ab; IEEE 802.3 clauses 34-42) Auto-Negotiation (Automatic Speed Selection) Full Duplex Operation at all Speeds, Half Duplex operation at 10 and 100 Mbit/s IEEE 802.1p QoS (Quality of Service) Support IEEE 802.1q VLAN support IEEE 802.3x Flow Control (IEEE 802.3 clauses 31-32; configurable)
	Power Management	ACPI compliant - multiple power modes Situation-sensitive features reduce power consumption Advanced link down power saving for reducing link down power consumption
	Performance Features	TCP/IP/UDP Checksum Offload (configurable) Large send offload and Giant send offload Receiving Side Scaling
	Manageability	Wake-on-LAN from standby and hibernation (Magic Packet and Microsoft Wake-Up Frame); Wake-on-LAN from off (Magic Packet only) PXE 2.1 Remote Boot Statistics Gathering (SNMP MIB II, Ethernet-like MIB, Ethernet MIB (802.3x, clause 30)) Comprehensive diagnostic and configuration software suite Virtual Cable Doctor for Ethernet cable status
	Interface	PCI Express 1.1 x1 to fully support ASPM L0s/L1 and CLKREQ
	NIC Device Driver Name	Realtek PCIe Gb Ethernet Family Controller

V.92 56K Data/Fax Modem	Form Factor	MDC 1.5 Daughtercard
	Power Management Support	APM Revision 1.2, ACPI
	Approvals/ Certifications	UL, CSA, NEMKO, CCIB, Industry Canada, FCC Part 68, CTR21, FCC Part 15 Class B, Canadian ICES-003 Class B, C.I.S.P.R.22, Australian ACA, CE Mark, Other Countries
	Data Mode Capabilities	V.92 data V.8bis V.80 V44, V.42bis, MNP5 (Compression) V.42 (LAPM, MNP2-4) (Error Correction) Optional symbol rates: 2800, 3429 Asymmetric Symbol rates Synchronous primary channel data signaling rates: 3600, 31200 Automatic rate re-negotiation V.34 V.32bis

		V.32 V.23 V.22bis V.22 V.21 Bell 212A Bell 103J
	Fax Mode Capabilities	TIA/EIA-578-B (Class 1) T.30, T.4 (Group 3) V.17 V.29 V.27ter V.21 Channel 2
	Command Set	V.250 (Partial) TIA-602 Identification: +GMI, +GMM, +GMR Port control: +IPR, +ICF, +IFC, +ILRR Modulation: +MS, +MR, +MA Error control: +ES, +ER, +EB, +ESR, +ETBM Data compression: +DS, +DR V.251
HP un2420 EV-DO/HSPA Mobile Broadband Module	Technology/Operating Bands	GSM/GPRS/EDGE: 850MHz(Cell), 900MHz(EGSM), 1800MHz(DCS), 1900MHz (PCS) UMTS/WCDMA with receive diversity: 2100MHz (UTRA FDD Band I), 1900MHz (UTRA FDD Band II), 900MHz (UTRA FDD Band VIII), 850MHz (UTRA FDD Band V) 1xEVDO/1xRTT with receive diversity: 850MHz (Band Class0-Cell), 1900MHz (Band Class1-PCS)
	Wireless Protocol Standards	GSM/GPRS/EDGE: Class B, Multi-slot operation, coding schemes CS1 – CS4 and MSC1 – MSC9. UMTS/WCDMA: Release 99 and Release 6 CDMA: 1xEVDO Release 0 and Release A, IS-95A, IS-95B, IS-2000
	Wireless Parametric Standards	Meets or exceeds TIA/EIA IS-98-D
	Maximum Data Rates	UMTS (HSPA) – 7.2 Mbps (Download), 2.0 Mbps (Upload) CDMA (EVDO Release A) – 3.1 Mbps (Download), 1.8 Mbps (Upload)
	GPS	Standalone GPS enabled
	GPS Bands	L1 – 1575.42 MHz
	Maximum Output Power	GSM/GPRS/EDGE: 32dBm (+/-1) WCDMA: 24dBm (+/-1) CDMA: 24dBm (+/-1)
	Maximum Power Consumption	2500mA (peak); 1000mA (average)
	Power Consumption, Sleep Mode	5 mA
	Power Management	USB selective suspend Integrated notebook wireless button

	Antenna Type	Dual high efficiency 5 band antennae with spatial diversity, mounted in the display enclosure
	Form Factor	PCI-Express MiniCard, USB 2.0 interface
	Weight	11.5 g
	Dimensions (Length x Width x Thickness)	2.01 x 1.18 x 0.18 in (51 x 30 x 5 mm)
	Voltage, Operating	3.3v +/- 10%
	Temperature, Operating (from TIA/EIA/IS-98-D)	–22° to 140° F (–30° to 60° C) (full RF performance) –22° to 167° F (–30° to 75° C) (reduced RF performance)
	Temperature, Non-operating, 96 hours (from MIL-STD 202 Method 108)	–40° to 185° F (–40° to 85° C)
	Humidity, Non-operating	85% relative humidity for 48 hours @ 185° F (85° C) (non-condensing)
	Configuration Utilities	HP Connection Manager
	LED Activity	LED Off – Radio Off; Solid LED On – Radio On
Atheros 9285G 802.11b/g/n 1x1 WiFi Adapter	Wireless LAN Standards	IEEE 802.11b IEEE 802.11g IEEE 802.11n
	Interoperability	Wi-Fi certified
	Frequency Band	2.4 GHz
	Data Rates	802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: many possible data rates, ranging from 6 Mbps to 300 Mbps, depending on the combination of Bandwidth, Modulation Coding Scheme, and Guard Interval used, as defined in IEEE 802.11n specification
	Modulation	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM
	Security[1]	Supports 64- and 128-bit WEP, WPA, WPA2, hardware-accelerated AES, 802.1x authentication types EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP-MSCHAPv2, LEAP, EAP-FAST.
	Sub-channels	Multinational support with frequency bands and channels compliant to local regulations.
	Media Access Protocol	CSMA/CA (Collision Avoidance) with ACK
	Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
	Roaming	IEEE 802.11 compliant roaming between access points
	Output Power (for CKK)[2]	17 dBm, nominal
	Output Power (for OFDM; power varies by data rate)[2]	15 dBm, nominal

	Power Consumption	Transmit: 1.5 W (max) Receive: 1.0 W (max) Associated to Access Point, Idle: 300 mW nominal Wireless Button Off: 75 mW nominal	
	Power Management	ACPI compliant power management 802.11 compliant power saving mode	
	Receiver Sensitivity[3]	54 Mbps: -75 dBm, 11 Mbps: -88 dBm , 1 Mbps: -93 dBm	
	Antenna type	High efficiency antenna with spatial diversity, mounted in the display enclosure	
	Form Factor	PCI-Express Half-MiniCard	
	Weight	0.013 lb (6 g)	
	Dimensions	0.19 x 1.06 x 1.18 in (4.75 x 26.8 x 30 mm)	
	Operating Voltage	3.3v +/- 9%	
	Temperature	Operating Non-operating	14° to 149° F (-10° to 65° C) -40° to 176° F (-40° to 80° C)
	Humidity	Operating Non-operating	10% to 90% (non-condensing) 5% to 95% (non-condensing)
	Altitude	Operating Non-operating	0 to 10,000 ft (3,048 m) 0 to 50,000 ft (15,240 m)
	LED Activity	LED Off - Radio OFF; Solid LED On - Radio ON	

1. Check latest software/driver release for updates on supported security features.
2. Maximum output power may vary by country according to local regulations.
3. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CKK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).

Intel Centrino Advanced-N 6200	Wireless LAN Standards	IEEE 802.11a IEEE 802.11b IEEE 802.11g IEEE 802.11n* * In countries where 802.11n is not allowed, this capability is not enabled.
	Interoperability	Wi-Fi certified Cisco Compatible Extensions Program compliant with Microsoft Windows Vista and XP (details at: http://www.hp.com/go/notebooks/WLAN)
	Frequency Band	2.4 GHz and 5GHz
	Antenna Structure	2 transmit; 2 receive (2x2)
	Data Rates	802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: 66 possible data rates, ranging from 6 Mbps to 300 Mbps, depending on the combination of Bandwidth, Modulation Coding Scheme, and Guard Interval used, as defined in IEEE 802.11n specification
	Modulation	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM, BPSK, QPSK, 16-QAM, 64-QAM
	Security[1]	Authentication: WPA and WPA2, 802.1x (EAP_TLS, TTLS, PEAP, LEAP, EAP-FAST) Authentication Protocols: PAP, CHAP, TLS, GTC, MS-CHAP, MS-CHAPv2

	Encryption: 64 and 128-bit WEP, AES-CCMP, CKIP, TKIP Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program Version 4) with Microsoft Windows Vista and XP only.	
Sub-channels	Multinational support with frequency bands and channels compliant to local regulations.	
Media Access Protocol	CSMA/CA (Collision Avoidance) with ACK	
Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)	
Roaming	IEEE 802.11 compliant roaming between 2.4GHz band Access Points	
Output Power (for CCK and OFDM)[2]	17 dBm max	
Power Consumption	Transmit: 2.3 Watts (max, with two spatial streams) Receive: 1 Watt (max with two spatial streams) Idle mode[3]: 35 mW (average) Radio off: 20 mW (max)	
Power Management	ACPI compliant power management 802.11 compliant power saving mode	
Receiver Sensitivity[4]	54 Mbps: -76 dBm, 6 Mbps: -92 dBm	
Antenna Connections	2 U.FL type connectors, 50 ohm nominal impedance	
Form Factor	PCI-Express Half-MiniCard	
Weight	0.0075 lb (3.4 g)	
Dimensions	0.12 x 1.06 x 1.18 in (3.1 x 26.8 x 30.0 mm)	
Operating Voltage	3.3V +/- 9%	
Temperature	Operating Non-operating	32° to 176° F (0° to 80° C) -40° to 176° F (-40° to 80° C)
Humidity	Operating Non-operating	10% to 90% (non-condensing) 5% to 90% (non-condensing)
Altitude	Operating Non-operating	0 to 10,000 ft (3,048 m) 0 to 50,000 ft (15,240 m)
LED Activity	LED Off - Radio OFF; Solid LED On - Radio ON	

1. Check latest software/driver release for updates on supported security features.
2. Maximum output power may vary by country according to local regulations.
3. In Power Save Polling mode and on battery power.
4. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CCK modulation) and a packet error rate of 10% for 802.11a/g (OFDM modulation).
5. WLAN supplier's client utility is required for Cisco Compatible Extensions support with Microsoft Windows XP. WLAN may also be compatible with certain third-party software supplicants. WLAN supplier IHV extensions required for Cisco Compatible Extensions support for Microsoft Windows Vista.

Ralink RT3090BC4 802.11b/g/n WiFi and Bluetooth 3.0 HS Combo	Wireless LAN Standards	IEEE 802.11b IEEE 802.11g IEEE 802.11n

Technical Specifications

Adapter	Interoperability	Wi-Fi certified Cisco Compatible Extensions Program compliantwith Microsoft Windows Vista and XP (details at: http://www.hp.com/go/notebooks/WLAN)
	Frequency Band	2.4 GHz
	Data Rates	802.11b: 1, 2, 5.5, 11 Mbps 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps 802.11n: 15, 30, 45, 60, 90, 120, 135, 150 Mbps
	Modulation	Direct Sequence Spread Spectrum DBPSK, DQPSK, CCK, OFDM
	Security[1]	Supports 64- and 128-bit WEP, WPA, WPA2, hardware-accelerated AES, 802.1x authentication types EAP-TLS, EAP-TTLS, PEAP-GTC, PEAP-MSCHAPv2, LEAP, EAP-FAST. Support for Cisco Security Features (proven compatibility with Cisco Aironet infrastructure products through the Cisco Compatible Extensions Program Version 4) with Microsoft Windows 7, Windows Vista and XP.
	Sub-channels	Multinational support with frequency bands and channels compliant to local regulations.
	Media Access Protocol	CSMA/CA (Collision Avoidance) with ACK
	Network Architecture Models	Ad-hoc (Peer to Peer) Infrastructure (Access Point Required)
	Roaming	IEEE 802.11 compliant roaming between access points
	Output Power (for CCK)[2]	17 dBm , nominal
	Output Power (for OFDM; power varies by data rate)[2]	15 dBm , nominal
	Power Consumption	Idle associated: 250 mW Idle unassociated: 150 mW Transmit: 2.0 W (max) Receive: 2.0 W (max)
	Power Management	ACPI compliant power management 802.11 compliant power saving mode
	Receiver Sensitivity[3]	54 Mbps: -71 dBm, 11 Mbps: -81 dBm , 1 Mbps: -90 dBm
	Antenna type	High efficiency dual band antenna with spatial diversity, mounted in the display enclosure
	Form Factor	PCI-Express Half-MiniCard
	Weight	0.013 lb (6 g)
	Dimensions	0.22 x 1.06 x 1.18 in (4.1 x 26.8 x 30 mm)
	Operating Voltage	3.3v +/- 10%
	Temperature	Operating: 14° to 149° F (-10° to 65° C) Non-operating: -40° to 176° F (-40° to 80° C)
	Humidity	Operating: 10% to 90% (non-condensing) Non-operating: 5% to 95% (non-condensing)
	Altitude	Operating: 0 to 10,000 ft (3,048 m) Non-operating: 0 to 50,000 ft (15,240 m)

	Configuration Utility[4]	Microsoft Windows XP Choice of Configuration Utility: • Microsoft Windows XP Wireless Network Connection Manager • Microsoft Windows Vista & Windows 7 Wireless Network Connection Manager
	LED Activity	LED Off - Radio OFF; Solid LED On - Radio ON

1. Check latest software/driver release for updates on supported security features.
2. Maximum output power may vary by country according to local regulations.
3. Receiver sensitivity is measured at a packet error rate of 8% for 802.11b (CCK modulation) and a packet error rate of 10% for 802.11a/g/n (OFDM modulation).
4. WLAN supplier's client utility is required for Cisco Compatible Extensions support with Microsoft Windows XP. WLAN may also be compatible with certain third-party software supplicants. WLAN supplier IHV extensions required for Cisco Compatible Extensions support for Microsoft Windows Vista.

Bluetooth 3.0 + HS Wireless Technology	Bluetooth Specification	BT 3.0 + HS
	Dimensions	0.22 x 1.06 x 1.18 in (4.1 x 26.8 x 30 mm)
	Frequency Band	2402 to 2480 MHz
	Number of Available Channels	79 (1 MHz) available channels
	Data Rates and Throughput	BT 2.1 + EDR 3 Mbps data rate; throughput up to 2.17 Mbps Synchronous Connection Oriented links up to 3, 64 kbps, voice channels Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric or 1306.9 kbps symmetric BT 3.0 + HS Throughput up to 25 Mbps
	Transmit Power	-6 dBm to 4 dBm (Bluetooth Class II)
	Receiver Sensitivity	Better than -80 dBM at 0.1 % raw bit error rate
	Power Consumption	Peak (Tx) 350 mW Peak (Rx) 250 mW Sleep <1 mW
	Antenna	Internally integrated within module
	Range	Up 33 ft (10 m)
	Electrical Interface	USB 2.0 compliant Microsoft Windows Plug and Play compliant
	Bluetooth Software Supported	Motorola Bluetooth Profiles and Stack
	Link Topology	Point to Point, Multipoint Pico Nets up to 7 slaves
	Security	Full support of Bluetooth Security Provisions
	Power Management	Microsoft Windows ACPI, and USB Bus Support Self configurable to optimize power conservation in all operating modes, including Standby, Hold, Park, and Sniff

Certifications	All necessary regulatory approvals for supported countries, including:	
	FCC (47 CFR) Part 15C, Section 15.247 & 15.249	
	ETS 300 328, ETS 300 826	
	Low Voltage Directive IEC950	
	UL, CSA, and CE Mark	
Temperature	Operating	-4° to 158° F (-20° to 70° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
Humidity	Operating	10% to 90%
	Non-operating	5% to 95%
Altitude	Operating	15,000 ft (4,572 m)
	Non-operating	40,000 ft (12,192 m)
Bluetooth Profiles Supported	Serial Port Profile (SPP)[1]	
	Service Discovery Applicaton Profile (SDAP)	
	Dial-Up Networking (DUN)[1,2]	
	Generic Object Exchange Profile (GOEP)[1,2]	
	Object Push Profile (OPP)[1,2]	
	File Transfer Profile (FTP)	
	Synchronization Profile (SYNC)	
	Hard Copy Cable Replacement (HCRP)[1,2]	
	Personal Area Networking Profile (PAN)[1,2]	
	Human Interface Device Profile (HID)[1,2,3]	
	FAX Profile (FAX)	
	Basic Imaging Profile (BIP)[2]	
	Headset Profile (HSP)	
	Hands Free Profile (HFP)	
	Advanced Audio Distribution Profile (A2DP)	

1. indicates the profile is supported by Microsoft Windows XP SP2
2. indicates the profile is part of Windows Vista

HP Integrated Module with Bluetooth 2.1 Wireless Technology	Bluetooth Specification	2.1 Compliant
	Dimensions	1.18 x 0.26 x 0.13 in (30 x 6.5 x 3.25 mm)
	Frequency Band	2402 to 2480 MHz
	Number of Available Channels	79 (1 MHz) available channels
	Data Rates and Throughput	3 Mbps data rate; throughput up to 2.17 Mbps
		Synchronous Connection Oriented links up to 3, 64 kbps, voice channels
		Asynchronous Connection Less links 2178.1 kbps/177.1 kbps asymmetric or 1306.9 kbps symmetric
	Transmit Power	-6 dBm to 4 dBm (Bluetooth Class II)
	Receiver Sensitivity	Better than -80 dBM at 0.1 % raw bit error rate

Power Consumption	Peak (Tx) 264 mW	
	Peak (Rx) 231 mW	
	Sleep <1 mW	
Antenna	Internally integrated within module	
Range	Up 33 ft (10 m)	
Electrical Interface	USB 2.0 compliant	
	Microsoft Windows Plug and Play compliant	
Bluetooth Software Supported	Broadcom Bluetooth for Windows	
	Microsoft Windows Bluetooth Software	
Link Topology	Point to Point, Multipoint Pico Nets up to 7 slaves	
Security	Full support of Bluetooth Security Provisions	
Power Management	Microsoft Windows ACPI, and USB Bus Support	
	Self configurable to optimize power conservation in all operating modes, including Standby, Hold, Park, and Sniff	
Certifications	All necessary regulatory approvals for supported countries, including:	
	FCC (47 CFR) Part 15C, Section 15.247 & 15.249	
	ETS 300 328, ETS 300 826	
	Low Voltage Directive IEC950	
	UL, CSA, and CE Mark	
Temperature	Operating	-4° to 158° F (-20° to 70° C)
	Non-operating	-40° to 176° F (-40° to 80° C)
Humidity	Operating	10% to 90%
	Non-operating	5% to 95%
Altitude	Operating	15,000 ft (4,572 m)
	Non-operating	40,000 ft (12,192 m)
Bluetooth Profiles Supported	Serial Port Profile (SPP)[1]	
	Service Discovery Applicaton Profile (SDAP)	
	Dial-Up Networking (DUN)[1,2]	
	Generic Object Exchange Profile (GOEP)[1,2]	
	Object Push Profile (OPP)[1,2]	
	File Transfer Profile (FTP)	
	Synchronization Profile (SYNC)	
	Hard Copy Cable Replacement (HCRP)[1,2]	
	Personal Area Networking Profile (PAN)[1,2]	
	Human Interface Device Profile (HID)[1,2,3]	
	FAX Profile (FAX)	
	Basic Imaging Profile (BIP)[2]	
	Headset Profile (HSP)	
	Hands Free Profile (HFP)	
	Advanced Audio Distribution Profile (A2DP)	

1. indicates the profile is supported by Microsoft Windows XP SP2
2. indicates the profile is part of Windows Vista

Environmental Data

Eco-Label Certifications

This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks:

- US Energy Star
- IT ECO declaration
- EPEAT – Gold

System Configuration

The configuration used for the Energy Consumption and Declared Noise Emissions data for the Convertible Mini tower Desktop model is based on a "Typically Configured Notebook"

HP ProBook 4320s Notebook PC

Energy Consumption	115 VAC	230 VAC	100 VAC
Normal Operation	10.141 W	10.939 W	10.159 W
Sleep (Energy Star low power mode)	0.55 W	0.67 W	0.51 W
Off	0.484 W	0.61 W	0.45 W

Heat Dissipation*	115 VAC	230 VAC	100 VAC
Normal Operation	35 BTU/hr	37 BTU/hr	35 BTU/hr
Sleep	2 BTU/hr	2 BTU/hr	2 BTU/hr
Off	2 BTU/hr	2 BTU/hr	2 BTU/hr

* Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.

HP ProBook 4420s Notebook PC

Energy Consumption	115 VAC	230 VAC	100 VAC
Normal Operation	8.436 W	8.58 W	8.373 W
Sleep (Energy Star low power mode)	0.55 W	0.56 W	0.55 W
Off	0.37 W	0.348 W	0.319 W

Heat Dissipation*	115 VAC	230 VAC	100 VAC
Normal Operation	29 BTU/hr	29 BTU/hr	29 BTU/hr
Sleep	2 BTU/hr	2 BTU/hr	2 BTU/hr
Off	1 BTU/hr	1 BTU/hr	1 BTU/hr

* Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.

HP ProBook 4320s Notebook PC and HP ProBook 4420s Notebook PC

Declared Noise Emissions
(in accordance with
ISO 7779 and ISO 9296)

System Fan Off	Sound Power (LWAd, bels)	Sound Pressure (LpAm, decibels)
Idle	1.5	24.2

Fixed Disk (random writes)	2.2	25.4

System fan is usually off except when charging the battery

Batteries

This battery(s) in this product comply with EU Directive 2006/66/EC

Batteries used in the product do not contain:

- Mercury greater the 5ppm by weight
- Cadmium greater than 10ppm by weight

The battery type and chemistry used in the product is:
CR2032 (coin cell), Li-ion
6-cell high capacity Li Metal battery (optional 8 cell available)

Additional information

This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive – 2002/95/EC.

This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.

This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).

This product is in compliance with the IEEE 1680 (EPEAT) standard at the Gold level, see: www.epeat.net

Plastics parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043.

This product contains 0% post consumer recycled plastic (by wt.)

This product is greater than 90% recycle-able when properly disposed of at end of life.

Packaging Materials

- External:
  - Corrugated Carton 412 g
  - Corrugated 326 g
- Internal:
  - Molded Pulp 150 g
  - Polyethylene low density 20 g
- The Polyethylene low density packaging material is made from 85% recycled content.
- The Corrugated Carton packaging material is made from 85% recycled content.
- The Corrugated packaging material is made from 85% recycled content.
- The Molded Pulp packaging material is made from 90% recycled content.

HP follows these guidelines to decrease the environmental impact of product

packaging:

- Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.
- Eliminate the use of ozone-depleting substances (ODS) in packaging materials.
- Design packaging materials for ease of disassembly.
- Maximize the use of post-consumer recycled content materials in packaging materials.
- Use readily recyclable packaging materials such as paper and corrugated materials.
- Reduce size and weight of packages to improve transportation fuel efficiency.
- Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.

Material Usage

This product does not contain any of the following substances in excess of regulatory limits (for reference of these limits please refer to the HP General Specification of the Environment: (http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html):

- Asbestos
- Certain Azo Colorants
- Certain Brominated Flame Retardants - may not be used as flame retardants in plastics
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- Formaldehyde
- Halogenated Diphenyl Methanes
- Lead carbonates and sulfates
- Lead and Lead compounds
- Mercuric Oxide Batteries
- Ozone Depleting Substances
- Polybrominated Biphenyls (PBBs)
- Polybrominated Biphenyl Ethers (PBBEs)
- Polybrominated Biphenyl Oxides (PBBOs)
- Polychlorinated Biphenyl (PCB)
- Polychlorinated Terphenyls (PCT)
- Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.
- Radioactive Substances
- Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)

Nickel finishes that release greater than 0.5 micro-grams/cm ^ 2/week, measured according to EN 1811:1998, are not used on any product surface designed to be frequently handled or touched by users.

End-of-life Management and Recycling

Hewlett-Packard offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: http://www.hp.com/go/reuse-recycle or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a

responsible manner.

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: http://www.hp.com/go/recyclers. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

Hewlett-Packard Corporate Environmental Information

For more information about HP's commitment to the environment:

Global Citizenship Report
http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html
Environment website
http://www.hp.com/environment
Eco-label certifications
http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/ecolabels.html
ISO 14001 certificates:
http://www.hp.com/hpinfo/globalcitizenship/environment/operations/envmanagement.html

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